

DETAILED ACTION

Specification

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 10-18 and 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Marom US Patent no. 6,950,609 in view of Chae et al. US Publication no. 2005/0068649 and further in view of Li US Patent no. 5,841,918.

Regarding claim 10, Marom discloses in Figure 7, an optical add/drop multiplexer connected to an optical fiber for transmission of a multiplexed optical signal, comprising:

a wavelength division multiplexing/demultiplexing (WDM) unit 730 connected to the optical fiber 720 having input and output ports providing a path for a multiplexed optical signal, and a plurality of demultiplexing ports (740-1, 740-2, ..., 740-k) respectively providing paths for demultiplexed channels; and

a plurality of add/drop multiplexer (ADM) units 741-1, 741-2, ..., 741-k (e.g., add/drop units that connect to respectively connected to demultiplexing ports 740-1, 740-2, ..., 740-k of the WDM unit.

Marom differs from claim 10 of the present invention in that he does not specifically disclose each of the ADM units including a circulator adapted to output a channel, input to a higher-order port, to a lower-order port, and a reflector connected between two ports of the circulator, and adapted to pass or reflect a channel input thereto, wherein the circulator receives a channel at a second port, outputs the channel to a third port connected to the reflector, receives the channel from the reflector at the third port, and outputs the channel to a fourth port thereof, thereby dropping the channel. Chae discloses an ADM unit including a circulator OC 208 adapted to output a channel, input to a higher-order port, to a lower-order port, and a reflector 224 FBG, and adapted to pass or reflect a channel input thereto, wherein the circulator receives a channel at port 3, outputs the channel to port 6 connected to the reflector 224, receives the channel from the reflector 224 at port 6, and outputs the channel to port 7 thereof, thereby dropping the channel. It would have been obvious to an artisan at the time of the invention was made to include the multiple port circulator taught by Chae in the ADM of Marom. One of ordinary skill in the art would have been motivated to do that in order to add or drop a specific wavelength in the optical communication system.

The combination of Marom and Chae does not specifically disclose the reflector of Chae is a wavelength independent reflector. Li discloses a Bragg grating can be a wavelength independent reflector (i.e., Figure 1 and col. 1, line 61 to col. 2, line 50 of Li discloses the Bragg grating can be tuned to reflect a selective wavelength by a tuning means. It would have been obvious to an artisan at the time of the invention was made to replace the Bragg grating reflector of Chae with the wavelength tunable Bragg

grating taught by Li in the apparatus of Marom and Chae. One of ordinary skill in the art would have been motivated to do that in order to redirect a specific wavelength into a specific port of a circulator.

Regarding claim 11, Marom discloses in Figure 7, wherein the WDM unit comprises:

an end circulator 715 having first through third ports and adapted to output an optical signal, input to a higher-order port, to a lower-order port, the first and third ports of the end circulator connected to the optical fiber 750, 710 for transmission of the multiplexed optical signal; and

a wavelength division multiplexer/demultiplexer (WDM) 730 having a multiplexing port connected to the second port of the end circulator and providing a path 720 for a multiplexed optical signal, and a plurality of demultiplexing ports 740-1, 740-2, ..., 740-k respectively providing paths for demultiplexed channels.

Regarding claim 12, Examiner take an official notice that wavelength division multiplexer/demultiplexer (WDM) comprises an arrayed waveguide grating is well recognized in the art.

Regarding claims 13 and 16, Marom discloses in Figure 7, an optical add/drop multiplexer connected to an optical fiber for transmission of a multiplexed optical signal, comprising:

a wavelength division multiplexing/demultiplexing (WDM) unit 730 connected to the optical fiber 720 having input and output ports providing a path for a multiplexed

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optical signal, and a plurality of demultiplexing ports (740-1, 740-2, ..., 740-k) respectively providing paths for demultiplexed channels; and

a plurality of add/drop multiplexer (ADM) units (e.g., add/drop units that connect to respectively connected to demultiplexing ports 740-1, 740-2, ..., 740-k of the WDM unit.

Marom differs from claim 10 of the present invention in that he does not specifically disclose each of the ADM units including a circulator adapted to output a channel, input to a higher-order port, to a lower-order port, and a reflector connected between two ports of the circulator, and adapted to pass or reflect a channel input thereto, wherein the circulator also receives a channel at a fifth port, outputs the channel to a first port connected to the reflector, and receives the channel from the reflector at the first port, thereby adding the channel. Chae discloses an ADM unit 30 including a circulator OC 208 adapted to output a channel, input to a higher-order port, to a lower-order port, and a reflector 224, and adapted to pass or reflect a channel input thereto, wherein the circulator 224 also receives a channel at port 1, outputs the channel to a first port 2 connected to the reflector 36, and receives the channel from the reflector 224 at the first port 2, thereby adding the channel. It would have been obvious to an artisan at the time of the invention was made to include the multiple port circulator taught by Chae in the ADM of Maron. One of ordinary skill in the art would have been motivated to do that in order to add or drop a specific wavelength in the optical communication system.

The combination of Marom and Chae does not specifically disclose the reflector of Chae is a wavelength independent reflector. Li discloses a Bragg grating can be a wavelength independent reflector (i.e., Figure 1 and col. 1, line 61 to col. 2, line 50 of Li discloses the Bragg grating can be tuned to reflect a selective wavelength by a tuning means. It would have been obvious to an artisan at the time of the invention was made to replace the Bragg grating reflector of Chae with the wavelength tunable Bragg grating taught by Li in the apparatus of Marom and Chae. One of ordinary skill in the art would have been motivated to do that in order to redirect a specific wavelength into a specific port of a circulator. Furthermore, since the reflector is a wavelength independent reflector, therefore whether a channel passing through the ADM unit sequentially passed through the second and third ports of the circulator, the reflector, and the first and second port of the circulator is merely an engineering design choice. It would have been obvious to an artisan at the time of the invention was made to direct a specific wavelength to a specific port of the circulator.

Regarding claims 14 and 17, Marom discloses in Figure 7, wherein the WDM unit comprises:

an end circulator 715 having first through third ports and adapted to output an optical signal, input to a higher-order port, to a lower-order port, the first and third ports of the end circulator connected to the optical fiber 750, 710 for transmission of the multiplexed optical signal; and

a wavelength division multiplexer/demultiplexer (WDM) 730 having a multiplexing port connected to the second port of the end circulator and providing a path 720 for a

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multiplexed optical signal, and a plurality of demultiplexing ports 740-1, 740-2, ..., 740-k respectively providing paths for demultiplexed channels.

Regarding claims 15 and 18, Examiner take an official notice that wavelength division multiplexer/demultiplexer (WDM) comprises an arrayed waveguide grating is well recognized in the art.

Regarding claims 22-24, since the reflector is a wavelength independent reflector, therefore whether a channel passing through the ADM unit sequentially passed through the second and third ports of the circulator, the reflector, and the first and second port of the circulator and wherein the dropped channel or the added channel and the passed channel have a same wavelength is merely an engineering design choice. It would have been obvious to an artisan at the time of the invention was made to direct a specific wavelength to a specific port of the circulator.

3. Claims 19-21 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

4. Applicant's arguments with respect to claims 10-24 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dzung D Tran whose telephone number is (571) 272-3025. The examiner can normally be reached on 9:00 AM - 7:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan, can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Dzung Tran
04/12/2008

/Dzung D Tran/

Primary Examiner, Art Unit 2613